Fighting with Infinity: A Proposal for the Addition of New Terminology

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Abstract: This paper proposes the addition of two new terms, “afinite” and “unfinite” to supplement the current terminology of “finite” and “infinite.” The restrictions of the current terminology used in science, math, and linguistics result in inaccurate conclusions. The new terms are defined both linearly and through the medium of a Punnett Square, and explained through both theoretical and applied uses. Articles using only the traditional terms reveal the shortcomings of using two narrowly defined terms. Using four terms, instead of the traditional two, results in more accurate and truthful knowledge. This paper does not attempt to determine whether specific theories, including Cantor’s set theory, Baye’s Theorem, or Chomsky’s Discrete Infinity Theory are correct or incorrect: it simply argues for the addition of two new terms in order to more accurately define ideas.

Keywords*:* Infinity, Finite, Afinite, Unfinite

Introduction

When I was a schoolchild, I was taught that a river held an infinite amount of water. This did not make a lot of sense to me- the world only had a finite amount of water in it, so how could a river contain an infinite amount? Nevertheless, all of us obediently memorized that a river could hold an infinite amount of water, and went on with our business. Except rivers don’t hold an infinite amount of water. They may hold a changing amount of water, but the amount is never infinite; in fact, infinity is a process, not a number, yet schoolchildren are still being taught that infinity is a very large number. While the science world uses “infinite” to sometimes refer to an incalculable number or amount, the math world fails to share this usage of the term “infinity.” Yet even in math, how does one define an incalculable number? Mathematicians may encounter an equation that is currently incalculable (i.e. 2 to the 10^{th} to the 23^{rd}), but that doesn’t mean it is infinite; the answer is very definitely finite, but no one can say exactly what the answer is.

Welcome to the Fight with Infinity

Science is not black or white, with no gray areas. Yet only two terms exist to define small and extremely small (or large or extremely large): finite or infinite. What about the gray areas that exist in between? A system with changing values is referred to as infinite, but it really isn’t; at any point in time, the quantity can be counted- it is not simple “infinite,” and to refer to it as such is both oversimplifying and inaccurate. The inaccuracy of using only two narrowly defined terms results in problems not just in the scientific field, but in many areas, including the field of linguistics. Since the planet Earth is considered a “closed” system, then everything on the planet is finite. Very few things in this world are truly infinite.

Definitions

Webster’s definition of <u>infinite</u> offers these parameters (Merriam-Webster, 2016):

1. extending indefinitely **:** endless <*infinite space*>
2. ***2*:** immeasurably or inconceivably great or extensive **:** inexhaustible <*infinite patience*>
3. ***3*:** subject to no limitation or external determination

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4. ***4a*** **:** extending beyond, lying beyond, or being greater than any preassigned finite value however large <*infinite number of positive numbers*>

Finite is also defined:

1. ***1a*****:** having definite or definable limits <*a finite number of possibilities*>***b*****:** having a limited nature or existence <*finite beings*>
2. ***2*****:** completely determinable in theory or in fact by counting, measurement, or thought <*the finite velocity of light*>

"Finite" and "infinite" are two terms currently available to describe amounts. An item is either "finite," or "infinite." In other words, an item must have either definite or indefinite limits. The two terms fail to address, however, the ability to measure an inconstant amount. In other words, an item may be in a changing state, yet is measureable at any one point in time. For instance, suppose a river flows past a specific area. The flow of water is not measurable, unless time is stopped: at that moment, the amount of water can be precisely measured. But when the water is *moving*, the amount cannot be accurately measured. The water is not infinite; it is part of a closed system (the Earth), and only so much water exists. But current terminology describes the amount of water is *infinite*, which is not accurate.

"Finite" refers to an item capable of being definite and being limited, and "infinite" refers to an item being adefinite (to distinguish from the term "indefinite, which has multiple meanings) and limitless. No terminology exists for an item that has *changing measurements and changing limits.* "Afinite" could refer to an item that has changing limits; in other words, amounts or parameters could be measured at any single point in time, but the item is in a state of flux. Afinite could also be defined as "not limited, but not infinite." The three terms, "finite," "afinite," and "infinity" would more accurately describe the three possibilities for limits (see Table 1):

Table 1. Finite, Afinite, and Infinite Definitions and Examples

Term	Definition	Example
Finite:	Definite; limited	3
Afinite:	Definite: unlimited	⧞
Infinite:	Adefinite; unlimited	∞

A fourth term would be needed to complete the idea. Using a Punnett Square, the last item would have to be adefinite and limited:

		Limited	**Unlimited**
(applied)	**Definite**	*finite*	*afinite*
(theoretical)	**Adefinite**	*unfinite*	*infinite*

Figure 1. Punnett Square Designating Finite, Afinite, Unfinite, and Infinite

The fourth term would then be *unfinite*, defined as adefinite and limited.
Afinite is designated as an infinity sign with a vertical line; unfinite is designated as an infinity sign with a horizontal line through it.

Table 2. Finite, Afinite, Unfinite, and Infinite Definitions and Examples

Term	Definition	Example
Finite:	Definite; limited	3
Afinite:	Definite: unlimited	⧞
Infinite:	Adefinite; unlimited	∞
Unfinite:	Adefinite; limited	∞̶

Four terms that would more accurately describe measurability and limitedness would be finite, afinite, infinite, and unfinite.

Infinity and Linguistics

Recursion

Recursion: "the determination of a succession of elements (as numbers or functions) by operation on one or more preceding elements according to a rule or formula involving a finite number of steps" (Merriam-Webster, 2016). To discuss recursion, let's approach it first as an applied idea, and then a theoretical one.

Applied

In language, a recursive sentence might be: "Once there was a story that started as once there was a story that…" The word count in the story is not infinite; at any point in time, one could stop and count the number of words, and have a definite amount. But because the story is adding elements continually, it would be called afinite; not limited, but definite at a given point in time. In other words, the word count is always changing, but it is still definite at a specific point in time. In the applied world, recursion creates a sentence which is afinite; removing recursion results in a finite sentence.

Theoretical

Let's look at the same recursive sentence from a theoretical standpoint: "Once there was a story that started as once there was a story that…" Theoretically, a person could tell this story forever; the sentence would be infinite. For the sentence to be theoretically unfinite, one would have to assume that the sentence would stop eventually, but one has no way of knowing when, so the sentence is adefinite. To be truly unfinite, one would have to be able to count the words that were spoken in the past. Unfinite depends on the ability to count the words after they have been spoken, and the sentence has stopped. In the theoretical world, recursion creates infinite sentence: stopping a recursive sentence at an unknown future point in time would result in an unfinite sentence.

Repetition

Repetition: "the act of saying or doing something again**:** the act of repeating something" (Merriam-Webster, 2016). Repetition is related to recursion, but not quite the same process. Let's look at the following sentence using repetition: "I am very, very, very, very tired of all this thinking." Repetition, therefore, is not the same as recursion (Corballis, 2011). Nevertheless, it does exist in language, and needs to addressed.

Applied

The sentence, as written above, is finite. It has a definite ending, and the words can be counted (11). But let's suppose the "very" went on ad nauseam: "I am very, very, very, very, very, very, very..." From an applied viewpoint, the sentence is now afinite. It has to momentarily stop at some time, the words be counted, and then continue.

Theoretical

"I am very, very, very, very, very, very, very..." Now our sentence is never-ending: infinite. Could the sentence be restructured to then be unfinite? If we could assume that at some point, the sentence would end, but no one knew that point, we could then count the words that were spoken *in the past*, and end up with an unfinite sentence.

Iteration

Iteration: "a procedure in which repetition of a sequence of operations yields results successively closer to a desired result" (Merriam-Webster, 2016). Like repetition, iteration is related to recursion, yet is also different. Iteration has an ending point at some time- recursion (as noted earlier) could theoretically result in an infinite

(never-ending) process, or a loop. Iteration, on the other hand, is a series of processes that build on the previous process, until the desired result is reached. Consider, for instance, this American classic:

100 bottles of beer on the wall,
100 bottles of beer,
You take one down, and pass it around,
99 bottles of beer on the wall.
99 bottles of beer on the wall,
99 bottles of beer,
You take one down, and pass it around,
98 bottles of beer on the wall.

(this goes on for quite a while, and then-)

1 bottle of beer on the wall,
1 bottle of beer,
You take it down, and pass it around,
No bottles of beer on the wall.

Is this simply repetition? No, because the condition changes with each successive verse. It is also not recursion, because the process has a definite stopping point- when the beer is gone. So is the song/situation finite, afinite, unfinite, or infinite?

Applied

Is the song/situation finite? Anyone can count the 100 bottles of beer, and that is all that exists. When the 100 bottles are gone, the song ends. A finite song. Could it be afinite? The singer could stop, and notice that he has 54 bottles of beer left, for instance, and then later is down to 35 bottles of beer, and then still later is at 20 bottles of beer. (Assuming he can sing and drink that long.) The number of full bottles is changing, but definite at any point in time, which describes the afinite condition.

Theoretical

Unfinite or infinite? Since the listener knows there are only 100 bottles, that fact rules out infinity. But suppose this was some sort of unhealthy drinking game, where the singer sings the song until he passes out. We know he starts out with a single bottle of beer, and at some point, he will stop singing, and depleting some of the 100 bottles of beer available. No one knows what that point is until it happens, so the situation could be considered unfinite, as we will eventually know the number of bottles of beer that were consumed, when the singer stops drinking. It is important to note that time plays a crucial role in determining whether a number of items can be described as finite, afinite, unfinite, or infinite. Most calculations currently assume that time has stopped, a practical yet inaccurate solution. The earth is moving, and few items stay still. Instead of labeling a changing number is infinite, (which is a process, not an amount), afinite and unfinite more accurately describe a changing number, value, or amount.

Vocabulary

Vocabulary: “all of the words known and used by a person” (Merriam-Webster, 2016). In terms of human vocabulary, many scholarly works state that language and/or vocabulary is infinite; that is, in a human’s lifetime, he is capable of producing an infinite number of expressions. The idea is sound, but the terminology is inaccurate; it would be more truthful to state humans are capable of producing afinite (applied) or unfinite (theoretical) utterances in their lifetimes. Currently, with only two terms to choose from, the resulting literature can be quite inaccurate.

Literature Review

The headline question: Is language infinite? should perhaps invite more scrutiny than it's generally given these days. It was posited by Chomsky in the context of a particular view of language: "A small set of rules operating on a large but finite set of words, generates an infinite number of sentences" The problem with this definition is that it assumes a very bounded and discrete view of all elements: rules, lexical items, sentences. Language is not

organized in sentences and the difference between words and rules is likely an artifact of dictionary making and grammar writing. But even if we did assume that, there is no guarantee, that the actual number of possible sentences is infinite rather than just unimaginably and practically inexhaustibly large (as was argued by Pullum and Scholtz in 2010). As a matter of practical fact, while the set of possible expressions in a given language may or may not be infinite, the actual set of all expressions ever uttered (even if we ignore language death) is going to be finite (because we cannot ignore the heat death of the universe). Now, the set of expressions actually produced by humans (or even machines) is going to be too large to practically enumerate by current (and possibly any) technology but it's going to be finite. So it really does not matter whether language is infinite at all (other than to keep certain formal theories internally consistent). What matters is that any language is going to allow a set of expressions that is sufficiently large for any purpose a human language can be put towards (Lukes, 2014).

Language can be theoretically infinite both textually and diachronically, over time. It would probably be more accurate to use a term such as Alan Turing's 'infinitive state', which he applied to computer memory which could always be added to, but would, at any point in time, be limited in actual use. At any given moment, however brief, there are a finite number of texts in existence, even though we couldn't calculate them and the number is changing all the time. A single neologism could offer trillions and trillions of new combinations, but the synchronic view is always finite; a closed system with a limited number of words that can combine in a limited number of ways cannot produce infinity. The fact that we couldn't get remotely close to exhausting a language's potential supply of sentences does not mean that it is not theoretically possible. Wilhelm von Humboldt seems to me wrong to believe that the finite can generate infinite variety; it can only be used infinitely through repetition (Flynn, 2003).

‘Discrete infinity’ refers to the property by which language constructs from a few dozen discrete elements an infinite variety of expressions of thought, imagination and feeling. For example, in English, sentences are built up of discrete units, words- you can have a sentence with 5 words, or with 6 words, but not with 5.5 words. And yet from these discrete units, one can create sentences of infinite length; there is no longest sentence. It is a property unique to human language (Llacerta, 2013). What sense is there in trying to envisage ‘nearly discrete’ objects being combined in ‘nearly infinite’ ways? A moment’s thought should remind us that when objects are subject to even limited blending, the range of combinatorial possibilities crashes to a limited set (Knight, 2008; 2009).

Instead of assuming that topics come from a finite Dirichlet distribution, we assume that it comes from a Dirichlet process (Ferguson, 1973) with a base distribution over all possible words, of which there are an infinite number. Bayesian nonparametric tools like the Dirichlet process allow us to reason about distributions over infinite supports. We review both topic models and Bayesian nonparametrics in Section 2. In Section 3, we present the infinite vocabulary topic model, which uses Bayesian nonparametrics to go beyond fixed vocabularies (Zhai and Boyd-Graber, 2013). The writers of linguistic theory struggle with “infinity” and “finite,” in that the terms aren’t precisely accurate, but “close enough.”

Discussion

But suppose terms such as “afinite” and “unfinite” were available? Humans would not possess an infinite vocabulary, but an *afinite* one. Also, humans would not be capable of producing an infinite amount of utterances, but rather an *unfinite* amount, which is absolutely more accurate. For simplicity’s sake, let’s use a willing human subject to illustrate exactly how these new terms would be applied: Bob.

Applied

Finite: We count all the words Bob knows, and Bob conveniently dies.
Afinite: We count all the words Bob knows now, and then count again later in the day, or maybe next month. The number can change, over time, but it is always countable.

Theoretical

Infinite: Bob never stops talking, and the words are uncountable.

Unfinite: Bob will eventually stop talking, but we don't know when, so we cannot calculate the number of words he knows or will know, only the ones he's uttered in the past.
By adding additional terminology, the ideas of language become more precise. And while the scenarios can change regarding Bob's (and our) vocabulary, the terms still remain relevant.

At any point in time, a human has a finite number of words at his disposal- i.e., words he uses, understands, or recognizes. But since a human changes over time, and his vocabulary changes along with him, his word count is actually *afinite-* (it changes over time, adding and subtracting words); it is never truly infinite. The number might be tremendously large, but it is still a finite number. Humans are not capable of producing an infinite number of words.

Suppose the longest word in American English consists of 100 letters, and the shortest word would consist of one letter. Mathematically, the number of words a human could generate would be 26 to the 100th power: 3.142931e+141. It's a very big number, but it is still a definite amount; thus, human vocabulary would be afinite, not infinite, in the applied study of language. The vocabulary is in flux, but is definite at any one point in time.

Discrete Infinity

"Galileo may have been the first to recognize clearly the significance of the core property of human language, and one of its most distinctive properties: the use of finite means to express an unlimited array of thoughts" (Chomsky, 2002 p. 45). Discrete Infinity, also known as "digital infinity" or the idea of "infinite use of finite means," basically theorizes that humans possess a digital mind in an analog world. (Darwinian theory would support that humans possess an analog mind in a digital world.) In very basic terms, humans have a finite mind in an infinite world. Rather than discuss which theory is correct, let's instead simply apply our new terminology to each idea. For simplicity's sake, we will resurrect Bob.

Darwin

Applied

Old terminology: Bob has an infinite mind in a finite world.
New Terminology: Bob has an *afinite* mind in a finite world. (afinite means we can measure Bob's vocabulary at various points in time.)

Theoretical

Old Terminology: Bob has an infinite mind in a finite world.
New Terminology: Bob has *unfinite* mind in a finite world. (unfinite means eventually Bob's mind will stop, and then his vocabulary will be definite.)

Chomsky

Applied

Old Terminology: Bob has a finite mind in an infinite world.
New Terminology: Bob has a finite mind in an *afinite* world. (afinite means we can count the items in Bob's world at various points in time.)

Theoretical

Old Terminology: Bob has a finite mind in an infinite world.
New Terminology: Bob has a finite mind in a *unfinite* world. (unfinite means at some point, Bob's world will cease to exist, and then his vocabulary will be definite.)

This paper is not discussing whether the theories of discrete infinity or Darwin's ideas are correct; it is simply introducing two new terms to more accurately describe ideas and/or theories in general.

Applications

With all this great information and new way of thinking, a question still exists: Why do we need 2 new terms, anyway? But afinite is all around us- it always has been. We've just been referring to it, (inaccurately) as infinite. Let's look at some real world applications for these two new terms:

Example 1

Suppose Jake wants to open a bank account, but he must account for the money.

Jake's bank account

Jake opened a bank account, and it was accruing interest.
FINITE
On the day Jake opened his bank account, he deposited 100 dollars in it.
AFINITE
The bank account has interest accruing continually.
UNFINITE
At some point, the bank account will close, and then Jake can count his money.
INFINITE
The bank never closes.

Example 2

Suppose Bob works in a doughnut shop, and he needs to know how many doughnuts are sold every hour. Since the number changes every hour, Bob might just say that he sells an infinite amount of doughnuts every day- except, that would not be accurate at all (and pretty exhausting!). Bob is really selling an *afinite* amount of doughnuts, as the handy chart below illustrates:

6 AM	127 doughnuts sold
7 AM	111 doughnuts sold
8 AM	212 doughnuts sold
9 AM	726 doughnuts sold
10 AM	513 doughnuts sold
11 AM	113 doughnuts sold

There really was not an *infinite* amount of doughnuts sold. Since Bob could count the amount of doughnuts sold every hour, he actually sold an *afinite* amount of doughnuts during the morning rush! If Bob were asked in the morning how many doughnuts he would sell by closing time, he would not have an accurate answer- that amount would be considered unfinite. In other words, Bob knows that at some point in the future, he will have sold a specific amount of doughnuts- but he does not know, at this time, what the total number will be.

After the doughnut shop closed for the day, Bob can tally his sales sheets, determine the daily total number sold (1,802), and his previously unfinite answer is now finite! If Bob were to sell doughnuts forever, he would sell doughnuts infinitely. (Infinity is a process, not a number.) Bob does not need to order an *infinite* amount of flour for the next 8 weeks' doughnut-making escapades- he needs to order an *afinite* amount. The amount will change every week, depending on business (see Figure 2).

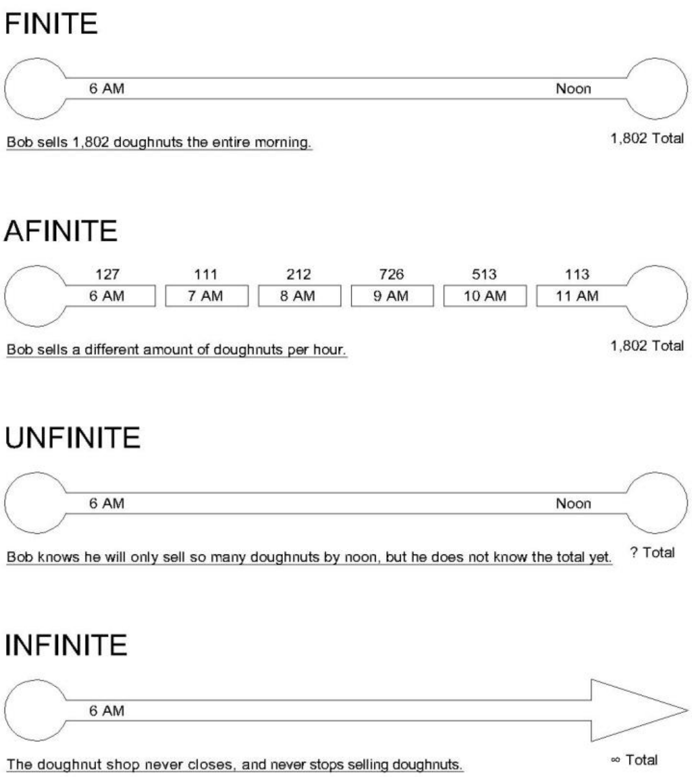


Figure 2.Application of Number Lines to Illustrate Finite, Afinite, Unfinite, and Infinite.

Example 3

Suppose a traffic light controller needs to know how many cars go through an intersection every hour, so she can accurately time the lights to handle the varying amounts of traffic.

Boss: How many cars go through the intersection every day?
TLC: An infinite amount, sir.
Boss: What? Order more roads built! Add more traffic lights! We'll never get to lunch!
Let's try that again, but using more accurate terminology.
Boss: How many cars go through the intersection every day?
TLC: An afinite amount, with the heaviest flow between 6-9 AM.
Boss: OK. Time the lights accordingly. Let's go get lunch!
Or, just to have fun-
Boss: How many cars will go through the intersection next year?
TLC: That would be an unfinite amount, sir, but I can let you know in 2 years.
Boss: But I need to know now, so I can request the next year's budget.
TLC: Last year's finite total was 240,726.
Boss: Great- let's go get lunch!

Example 4

And what if a teacher needed to order classroom supplies?

Teacher: Yes, I'd like to order an infinite amount of paper for my class.
Clerk: Of course, that will be...wait a minute…carry the 2…
Let's try that again.
Teacher: I need to order an unfinite amount of paper for my class.
Clerk: Of course, let's just look at your order from last year…

Teacher: I will need more this year- we're working on geometry.
Clerk: Well, let's start with 12 boxes, and you can order more later.
Teacher: Yes, that will be perfect. I don't know how much I'll need for the year, but I will know by mid- semester.
Clerk: And by that time, we can work out the price for the year. Next, please?
Coach: I need to order an infinite number of basketballs.
Clerk: Of course, that will be…wait a minute…carry the 2…
Coach: I need enough for the year.
Clerk: How about the finite amount of 928 basketballs?
Coach: Perfect!

Example 5

A physics student is working on a homework problem. He has a box with a peephole cut into it, and an unknown amount of marbles rolling around inside the box. The homework problem asks him to calculate how many marbles he can see through the peephole every five minutes, for one hour, when the box is shaken. He also needs to determine how many marbles are in the box (see Figure 3).

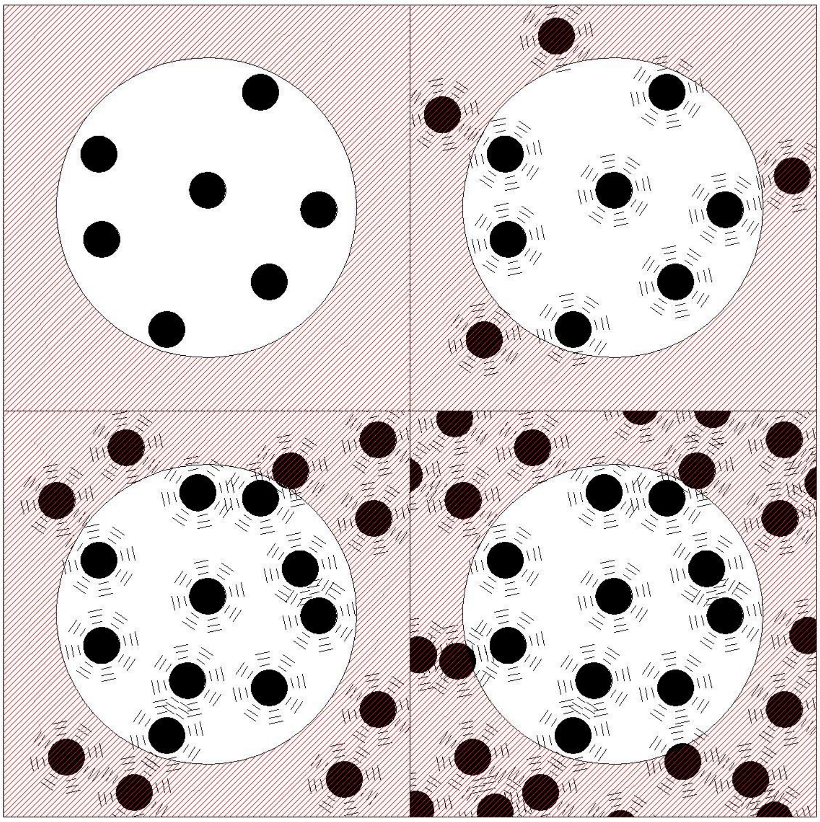


Figure 3. Chart Depicting Examples of Finite, Afinite, Unfinite, and Infinite.

It is much easier (and more accurate) to use *unfinite* and *afinite*!

Infinity and Math/Science

The science battles with infinity took a drastic turn for the worse with the advent of set theory in mathematics (Wolchover, 2013). Georg Cantor postulated and proved the idea of different kinds of infinities (Wolchover, 2013, and Chow, 2013). For example, consider the set of positive integers: it is indeed an infinite set. To

illustrate, determine the greatest positive integer possible; if it is N, then N+1 would be greater than the prior N. The set is infinite because the proposed mechanism by which the set of integers is constructed allows for an infinite number of steps.

The integer zero is considered the neutral element (or additive identity) for addition, while the integer 1 is called the neutral element (or multiplicative identity) for multiplication. Thus, if N is a positive integer, then N+0 = N, and N*1 = N. But how does one arrive at this integer N when starting from the integer one?

$$\underbrace{1+1+1+1+1+1+\cdots+1}_{N} = N.$$

The process can go on ad infinitum; however, an integer called infinity does not exist (Adam, 2011, and Tegmark, 2015), but the process of adding ones, which can go on forever, is referred to as infinite. An analogous argument can be made for the negative integers by introducing directionality along the integral line and the idea of additive inverses. As an aside, even multiplication of positive numbers can be regarded as an addition.

Cantor highlighted another kind of infinity surpassing that of the natural numbers: the real numbers (Adam, 2011). (Natural numbers can be called positive integers) Cantor proved this assertion via a diagonalization process whereby he showed the lack of a bijection between the set of natural numbers and the set of all infinite sequences of binary digits (zeros and ones). For example, there are just as many real numbers in the open interval (-π/2, π/2) as on the whole real number line because there is a bijection, namely Tan (x), between the two sets. This translates to saying that the open interval (-π/2, π/2) of real numbers is much more infinite than the set of positive integers. Finally, the arithmetic process of dividing can be finite, infinitely repetitive or truly infinite; again, it is the process which may be infinite, and not necessarily a number (Adam, 2011).

If we accept that it is the process that is infinite, how are processes, such as taking limits in calculus, affected? They are not, because accuracy only goes so far; it is only for the benefit of aesthetics that scientists hold on to the idea of infinite limits.

$$\lim_{x\to\infty}\frac{2x^2-x+1}{x^2+3x-4}$$

This process illustrates what happens to the ratio $\frac{2x^2-x+1}{x^2+3x-4}$, as the variable x gets larger and larger without bound. The answer is, of course, 2. Must one really rely on infinity to prove this?

Let x = 10^{26}, (which by the way is a huge number). The ratio is:
19999999999999999999999999990000000000000000000000001/10000000000000000000000000299999999999999999999999996, which is like 1.9999999999999999999, and with all of our available accurate measuring tools, the answer is 2. Except it isn't really 2; it is a form of acceptable, but not entirely accurate, shorthand notation. In fact, we can figure exactly how large x needs to be, given a desired accuracy.

Probability theory is another area where the battle for infinity rages on. Two basic definitions of probability exist: the Frequentist definition, and the Bayesian definition. Consider an experiment with N trials, each of which can result in a success or failure by some criterion. Let N_s be the number of successes, and N_s/N is the frequency of successes for those trials. The Frequentists define probability as follows:

$$p = \lim_{N\to\infty}\frac{N_s}{N}$$

This definition is asymptotic (including infinite limit). However, as humans do not have infinite time, then according to the Frequentists, one can never determine the probability of anything based on this definition (Swendsen, 2012). Meanwhile, Bayesians declare that probability is a description of a person's knowledge of the outcome of a trial based on whatever evidence is at said person's disposal (Swendsen, 2012). For example, the rest mass of an electron is 9.10938356(11) x 10^{-31} kg. This makes sense from a Bayesian standpoint because it expresses our uncertainty about the exact value for the rest mass of an electron. Physicists do take issue with the Bayesian definition of probability, because they view as suggestive, inaccurate, and untruthful.

Scientists need a more accurate way to encapsulate the science they perform, especially when referring to something extremely large or extremely small. The current definition of bigness lacks proper contexts-researchers need something more than just finite and infinite (Tegmark, 2015). Cantor wondered about infinity

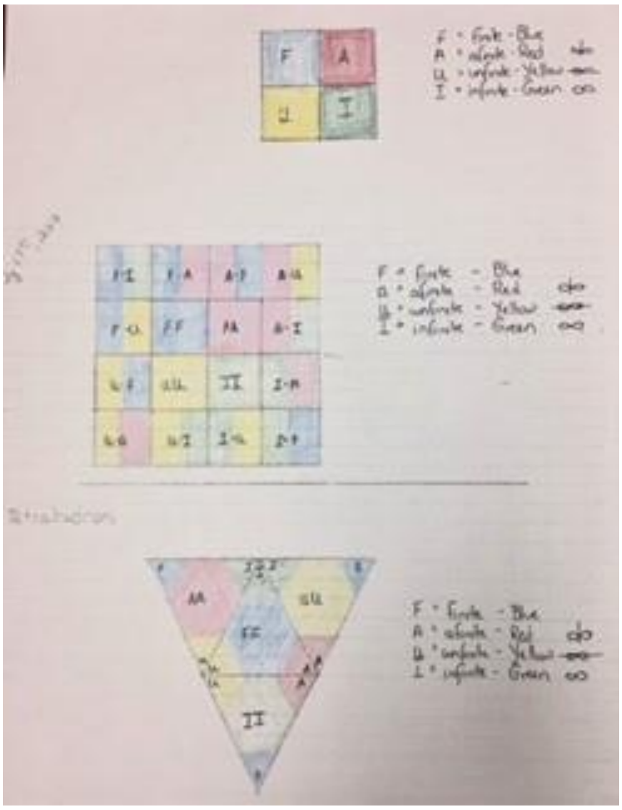
between the integers and the so-called real numbers (hence the continuum hypothesis). Cantor indeed did develop a rich taxonomy of the infinite: $\aleph_0$, $\aleph_1$, $\aleph_2$, …, $\aleph_\varpi$ and so forth (Refs). However, these terms express sets of infinite cardinality, which we argue can only be assigned to a process and not necessarily a number variety. Thus, researchers, who do not have infinite amount of time, are still in need of more terms besides finite and infinite to describe the science that they perform.

Farmer Brown's Field of Infinity: Applying multiple variables within Afinity Theory

One cannot work with Afinity Theory for very long without realizing that the universe is made up of multiple items. Once this realization takes place, the next logical step is to combine terms to describe the world surrounding us. But to do so requires some basic ground rules regarding notation, hierarchy of terms, and application of terms. To review, we start with the Punnett Square of Afinity:

		Limited	**Unlimited**
(applied)	**Definite**	*finite*	*afinite*
(theoretical)	**Adefinite**	*unfinite*	*infinite*

Note that all the terms are singular; that is, there is no combining of terms. Each term is isolated. But the universe is anything but singular items. If one were to combine terms, the result might be graphed as follows:



Both figures represent the same idea, but are presented in different formats. With the four terms now combined into all possible combinations, (including repeating terms), it is easy to apply the combinations with a real life example.

Farmer Brown

Farmer Brown grows organic Kamut, an ancient wheat grain. Because he contracts with a parent company, he must keep track of all the wheat he grows on his farm. He tallies the actual number of wheat plants, and the number of kernels found on each plant.
W = Wheat Plants
K = Kernels

Single Variable Example:
Finite = 100 Wheat plants
Afinite = Changing Daily amounts of Kernels
Unfinite = Future amount of Total Kernels produced
Infinite = The Wheat plants never stop producing Kernels
Two Variable Example:
Finite:
F-F = 100 W produces 2,000 K on a specific day.
F-A = 100 W produces various amounts of K on various days.
F-U = 100 W will eventually produce 2,000 K on the final day.
F-I = 100 W will continually produce K forever.
Afinite:
A-F = Changing amounts of W will produce 2,000 K on a specific day.
A-A = Changing amounts of W will produce various amts. of K on various days.
A-U = Changing amounts of W will eventually produce 2,000 K on the final day.
A-I = Changing amounts of W will continually produce K forever.
Unfinite:
U-F = A future final amount of W will only produce 2,000 K on a specific day.
U-A = A future final amount of W will produce various amts. of K on various days.
U-U = A future final amount of W will produce 2,000 K on the final day.
U-I = A future final amount of W will continually produce K forever.
Infinite:
I-F = A continually increasing amount of W will produce 2,000 K on a specific day.
I-A = A continually increasing amount of W will produce various amts. of K on various days.
I-U = A continually increasing amount of W will produce 2,000 K on the final day.
I-I = A continually increasing amount of W will continually produce K forever.

The notation for dealing with multiple terms, then, would be as follows:
1. F = Finite
2. A = Afinite
3. U = Unfinite
4. I = Infinite

One would write any finite information first, then afinite information, then unfinite and infinite information, respectively. Justification for this hierarchy of terms includes that all known terms are notated first, for ease of calculation. This hierarchy does not need to be rigidly adhered to, but is suggested as a standardization for calculations.

Conclusions

This paper introduces two new terms, *afinite* and *unfinite*, to more accurately describe the characteristics of language. The same terms can be applied to other fields of study, such as chemistry or physics. The new terminology may be more easily understood when using a Punnett Square:

		Limited	**Unlimited**
(applied)	**Definite**	*finite*	*afinite*
(theoretical)	**Adefinite**	*unfinite*	*infinite*

The new terminology does not change the premises or theories currently in use; it simply offers a more accurate vocabulary.

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